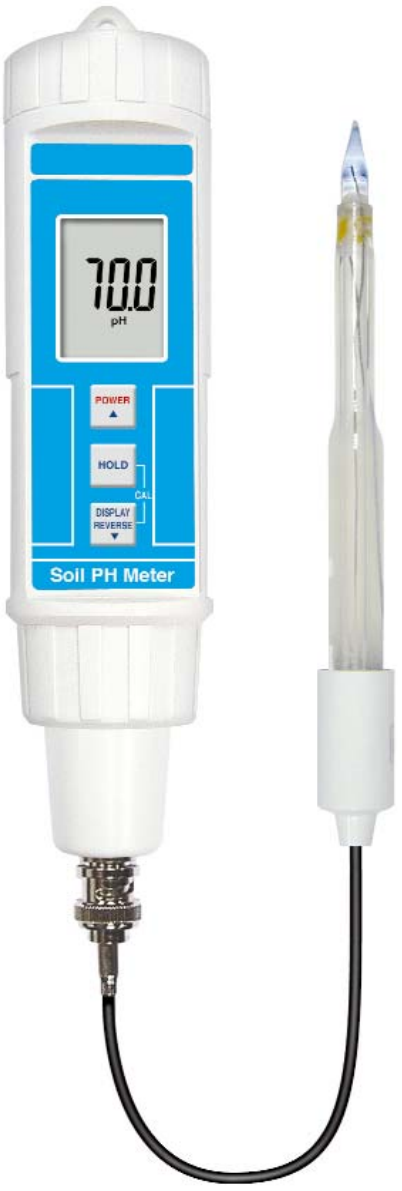
Pen type, separate electrode

SOIL PH METER

Model : PH-220S



Your purchase of this SOIL PH METER marks a step forward for you into the field of precision measurement. Although this METER is a complex and delicate instrument, its durable structure will allow many years of use if proper operating techniques are developed. Please read the following instructions carefully and always keep this manual within easy reach.

QUALITY ASSURED FIRM ISO 9001 SGS

UKAS QUALITY MANAGEMENT 005

OPERATION MANUAL

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1. FEATURES

* Complete set with pen pH meter, soil pH electrode, pH 4.0 /pH 7.0 standard buffer solution.
* Spear Tip pH electrode (included), ideal for penetration pH measurement into soil, meats, cheese and other type of measurements requiring sample penetration. The electrode features a very durable glass measuring spear packaged in a rugged virtually unbreakable epoxy body.
* Separate soil pH electrode, easy for general purpose usage and remote measurement.
* Auto calibration for pH 4, pH 7 or pH 10.
* Build in reverse display button.
* Data hold.
* Auto power off.
* Compact size, light weight.
* Optional carrying case.
* Water resistance on the front panel.
* Application : Agriculture, Gardening, Food industrial, Education, School, Colleges, Laboratory, Industrial and Quality control.

2. SPECIFICATIONS

2-1 Meter

Display	LCD, size : 20 mm x 28 mm. * *User can reverse the display direction by push button.*
Measurement Range	0 to 14 pH x 0.01 pH
Resolution	0.01 pH

Accuracy	± 0.07 pH(pH5 to pH 9) ± 0.1 pH(pH4 to pH4.9, pH9.1 to pH10) ± 0.2 pH(pH1 to pH3.9, pH10.1 to pH13) ** 23± 5℃* ** After calibration.*
Input Impedance	10^12 ohms.
Temperature Compensation	Not necessary to make adjustment.
Sampling Time	Approx. 0.8 second.
Hold Function	To freeze the display reading value.
Calibration method	Auto calibration, pH 7, pH 4 (or pH 10)
pH electrode connector	BNC connector.
Operating Temperature	0 to 50 ℃ (32 to 122 ℉)
Operating Humidity	Less than 80% RH.
Power Supply	DC 1.5V battery (UM-4/AAA) x 4 PCs.
Power Consumption	Approx. 4.8 mA.
Dimension	Meter :180 x 40 x 32 mm (7.1 x 1.6 x 1.3 inch).
	Electrode : Body size : 12 mm dia. x 160 mm. Electrode cable length : approx.. 1000 mm.
Weight	220 g/0.48 LB (included electrode).

Standard Accessories	Instruction Manual..... 1 PC. Soil pH electrode, PE-06HD..... 1 PC. pH 4.0 buffer solution, PH-04A..... 1 PC. pH 7.0 buffer solution, PH-07A..... 1 PC.
Optional Accessories	* Soft carrying case with sash (210 x 110 x 55 mm), Model : CA-05A
	* Hard carrying case (280 x 195 x 65 mm), Model : CA-06

2-1 Soil pH Electrode (included)

pH Measuring Range	1 to 13 pH (typical 0 to 14 pH).
pH Operation Temperature	5 to 60 ℃ (41 to 140 ℉).
pH Electrode Structure	Combination type.
Reference of pH Electrode	Ag/AgCl, Double Junction.
Zero Potential for pH Value	7± 1 pH.
Repeatability	0.05 pH.
Response time	≧ 2 minutes.
Body Material	Epoxy.
Connector	BNC.
Mechanical Protection	With protection bottle (soaker bottle) on the electrode head.
Weight	68 g (including cable & socket).
Dimensions	Body length - 160 mm. Body Dia. - 12 mm. Cable length - 1000 mm.

3. FRONT PANEL DESCRIPTION

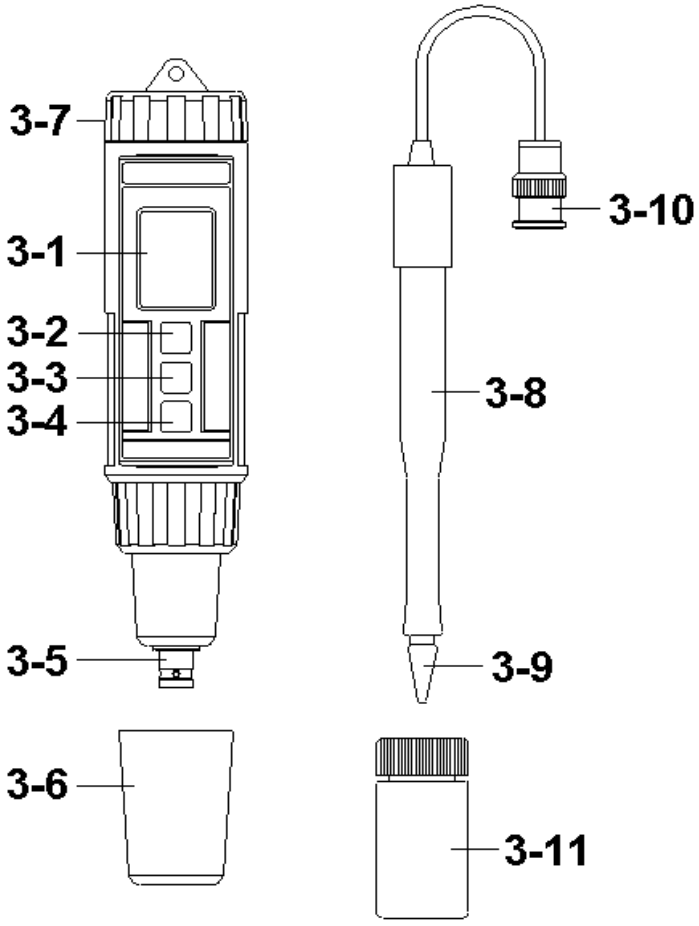


Fig. 1

3-1 Display
3-2 Power button (▲ button)
3-3 Hold button
3-4 Display reverse button (▼ button)
3-5 pH electrode BNC socket
3-6 BNC protection cover
3-7 Battery compartment/Cover
3-8 pH electrode handle
3-9 pH electrode sensing head
3-10 pH electrode BNC plug
3-11 pH electrode protection bottle

4. pH CALIBRATING PROCEDURE

4-1 Calibrating Consideration

The pH meter already calibrated by mV signal that simulated from the ideal pH ELECTRODE mV output (base on 25 ℃ environment). However due to (a) An ideal electrode will produce 0 mV at pH 7.00, but most electrodes are slightly off. (b) The measuring environment temperature may not near 25 ℃ (15 to 35 ℃).
If intend to keep instrument combined electrode within high accuracy, it is necessary to make the following calibration procedures (4-3).

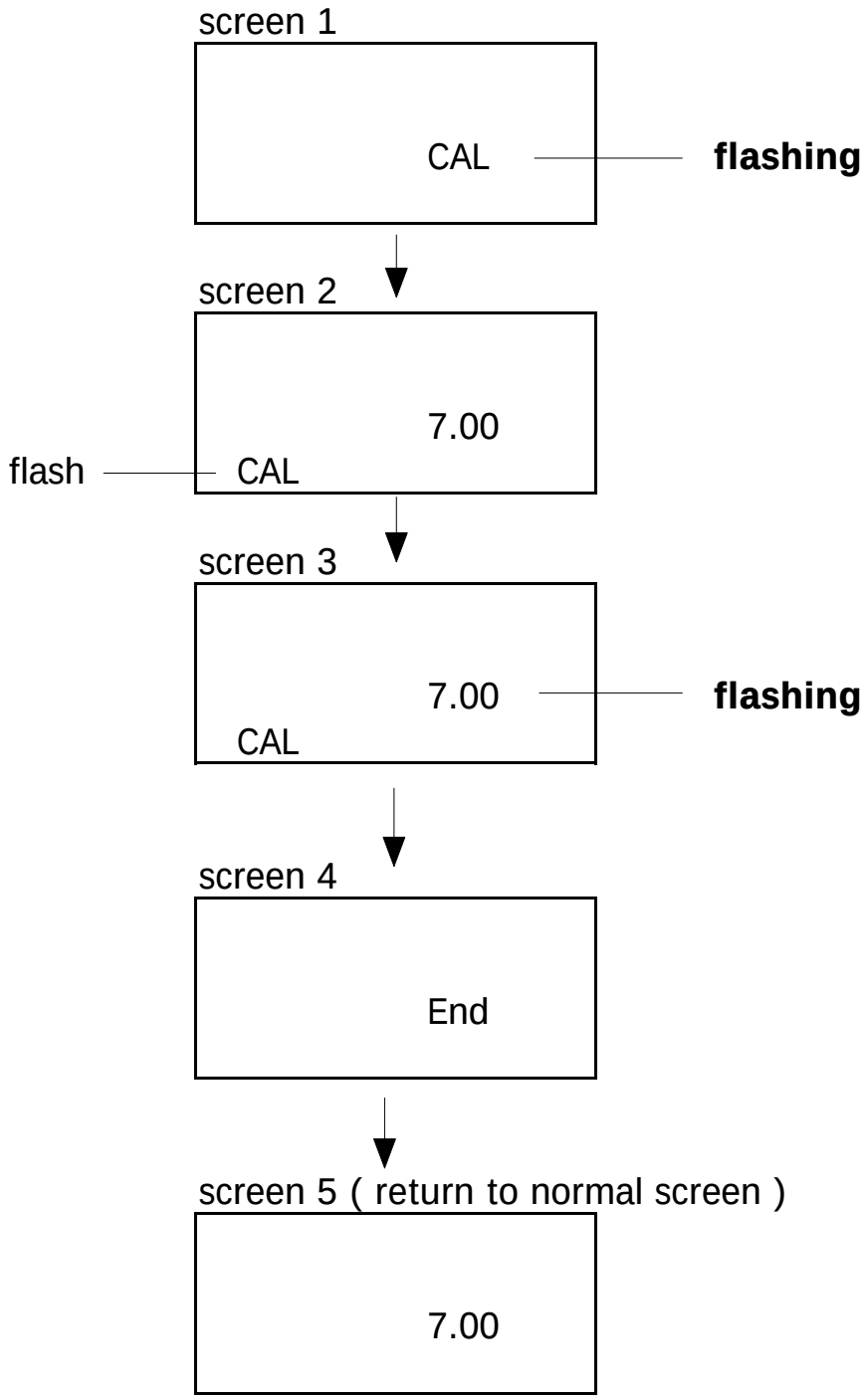
4-2 Requiring Equipment for Calibration

1) Combination soil pH electrode (PE-06HD, included).
2) Buffer solutions :
   pH 7.00 buffer solution (PH-07A, included).
   pH 4.00 buffer solution (PH-04A, included).

4-3 Calibration procedures

pH 7 calibration

1) Connect the pH electrode plug (3-10, Fig. 1) to the BNC socket (3-5, Fig. 1) and place electrode into pH 7.00 buffer solution (PH-07A).
2) Power on the instrument by pressing the " Power button " (3-2, Fig. 1).
3) Press the " Hold button " (3-3, Fig. 1) once.
   the display will show the " HOLD " symbol.
   Press the " ▼ button " (3-3, Fig. 1) once, the display will show following screen in sequence.


screen 1
CAL
flashing
screen 2
7.00
flash
CAL
screen 3
7.00
flashing
CAL
screen 4
End
screen 5 (return to normal screen)
7.00

pH 4 calibration

1) Rinse the electrode in distilled water.
   Place electrode into buffer pH 4.00 solution.
2) All the calibration procedures are same as the above pH calibration, except :
   a. Change the buffer solution to pH 4.00 (PH-04A).
   b. The calibration screen value will change to 7.00 instead of 4.00

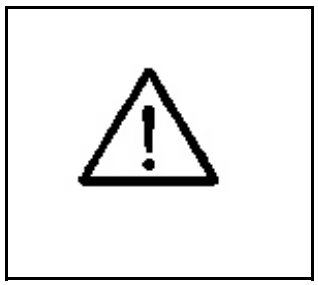
Remark :

* Except calibrate pH 7, pH 4, meter also can calibrate pH 10.
* The calibration procedures should start from the pH 7 at first, then pH 4 (or pH 10).
* During the calibration, the circuit will sensing solution value automatically. If the buffer solution value already beyond 7± 1 pH. 4± 1 pH, 10± 1 pH, the LCD will show " Err ".
* When the LCD show the screen 2, it allow the user to adjust another calibration value precisely (for example 7.01, 6.99...) by pressing the " ▲ button " (3-2, Fig. 1) , " ▼ button " (3-4, Fig. 1)'
* Rinse the electrode in distilled water before change the buffer solution.
* Repeat above pH, pH calibration procedures two times at least.
* After calibration, the " Electrode sensing head " (3-9, Fig. 1) should insert into the " Protection bottle " (3-11, Fig. 1).
* ***PE-06HD, PH-07A, PH-04A is the consumer accessory.***

5. MEASURING PROCEDURE

After the meter along the pH electrode is calibrated (section 4-3) , the unit is ready for measuring.

1) Connect the pH electrode plug (3-10, Fig. 1) to the BNC socket (3-5, Fig. 1) and place electrode into the measured solution.
2) Power on the meter by pressing the " Power button " (3-2, Fig. 1).
3) Place the electrode into the measured soil or other type penetration material (such as cheese, meats...) or solution, then the instrument will display the pH value.



** Electrode (attached) is the rough and durable penetration electrode. However user should operate the electrode very carefully.*

** The electrode is the consumer accessory, after the electrode is used, if the damage of the Electrode Sensing Head (Spear Tip Head), it is without warranty.*

**** After make the measurement, please rinse the electrode in distilled water.***

**** After calibration, the " Electrode sensing head " (3-9, Fig. 1) should insert into the " Protection bottle " (3-11, Fig. 1).***

**** PE-06HD, PH-07A, PH-04A is the consumer accessory.***

Data hold

During the measurement, press the " Hold button " (3-3, Fig. 1) once will hold the measured value & the LCD will display a " HOLD " symbol.

** Press the " Hold Button " once again will release the data hold function.*

Display reverse

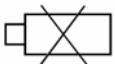
During the measurement, press the " Display reverse button " (3-4, Fig. 1) once will reverse the display direction for the user convenience.

** Press the " Display reverse button " once again will return to the normal display.*

Auto power off

The meter is built the " Auto power shut off " function to save battery life. If any function buttons are not pushed within 10 minutes, the power will be off automatically.

6. REPLACEMENT OF BATTERY

1) When the LCD display show "  " ,
   It is necessary to replace the battery. However, in-spec measurement may still be made for several hours after Low Battery Indicator appears before the instruments instrument become inaccurate.
2) To replace the battery, rotate and remove the " Battery Cover " (3-7, Fig. 1), take out the old batteries, install new batteries :

   DC 1.5V battery (UM-4/AAA) x 4 PCs.

3) When install the batteries, should make attention the battery polarity.
4) After install the batteries, reinstall the battery cover again.

7. OPTIONAL ACCESSORIES

SPEAR TIP pH ELECTRODE
Model : PE-06HD
Spear tip pH electrode is ideal for penetration pH measurements into meats, cheese, soil and other types of measurements requiring sample penetration.

pH 7.00 buffer solution
Model : PH-07A

pH 4.00 buffer solution
Model : PH-04A

CARRYING CASE Model : CA-06
Hard carrying case.
(280 x195 x 65 mm).

CARRYING CASE Model : CA-05A
Vinyl soft case.
(260 x110 x 55 mm).

Hard carrying case. Model : CA-06 280 x195 x 65 mm	Soft carrying case. Model : CA-05A 260 x110 x 55 mm